

Claims

1. A fuel injection device (10), in particular for an internal combustion engine with direct fuel injection, having a housing (12) and at least two valve elements (20, 22), located in the housing (12) and coaxial to one another, to each of which at least one fuel outlet opening (24, 26) is assigned, and on the outer valve element (20), radially outward from the at least one fuel outlet opening (24) assigned to it, there is a first sealing region (64), which cooperates with a valve seat (66) on the housing and which can separate the at least one fuel outlet opening (24) from a high-pressure connection (40), characterized in that on the outer valve element (20), between the at least one fuel outlet opening (24) assigned to it and the inner valve element (22), there is an additional sealing region (72).
2. The fuel injection device (10) in accordance with claim 1, characterized in that the additional sealing region (72), immediately after the manufacture of the device (10), with the outer valve element (20) closed, has a slight spacing, preferably approximately 1 to 2 μm , from a valve seat (66) associated with it.
3. The fuel injection device (10) in accordance with claim 2, characterized in that the first sealing region (64) is embodied on the edge of a groove (68) extending around the outer valve element (20).

4. The fuel injection device (10) in accordance with one of claims 1 or 2 in combination with claim 3, characterized in that an encompassing shallow groove (74) extends approximately from the encompassing groove (68) approximately into the additional sealing region (72) on the outer valve element (20).

5. The fuel injection device (10) in accordance with one of claims 1 or 2 in combination with claim 3, characterized in that a plurality of grooves (74) are present, distributed over the circumference and all extending in the axial direction approximately from the encompassing groove (68) approximately into the additional sealing region (72).

6. The fuel injection device (10) in accordance with one of the foregoing claims, characterized in that the additional sealing region (72) is embodied on the edge of an encompassing narrow, deep groove (80), which is located in the direction toward the first sealing region (64).

7. The fuel injection device (10) in accordance with one of the foregoing claims, characterized in that the additional sealing region (72) is embodied on an annular protuberance (70) projecting from the outer valve element (20).

8. The fuel injection device (10) in accordance with one of the foregoing claims, characterized in that a guide gap (78) present between the two valve elements (20, 22) communicates with a chamber (72) that communicates at least from time to time with the high-pressure connection (40).

9. A method for producing a fuel injection device (10) in accordance with one of the foregoing claims, characterized in that the outer valve element (20) is fabricated such that the additional sealing region (72), with the outer valve element (20) closed, initially has a slight spacing, preferably of approximately 1 to 2 μm , from a valve seat (66) associated with it; and that then by repeated actuation of the outer valve element (20), the first sealing region (64) and/or the valve seat (66) associated with it is deformed such that the spacing between it and the valve seat (66) associated with it becomes less or tends toward zero.